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FUEL RATIONING

IN our issue of March 19 we discussed at some length the all-important question of the "rationing" of fuel, foreshadowing, as events have proved, the general tenor of the subsequent statement by the Prime Minister in the House on March 27. Mr. Attlee emphasized—as indeed was to be expected—that during the coming summer the country will continue to be faced with a grave shortage of coal. Total requirements, he said, for consumption during the six months May 1 to Oct. 31 of this year, are estimated at 92,000,000 tons. To this must be added 10,000,000 tons required to rebuild stocks by Nov. 1 to 15,000,000, making a total requirement of 102,000,000. Mr. Attlee went on to say that the Government did not count on a production during the six summer months of the amount required. The deficiency may turn out to be as much as 10,000,000. Hence the Government's view that domestic and non-industrial consumers must aim at saving 2,500,000 tons of coal during the coming summer, and the intention is to introduce a scheme for "rationing" domestic and non-industrial consumption of gas and electricity, and it is proposed to apply restrictions on the use of gas and electricity for heating rooms in residential premises during the summer and to maintain the existing prohibition on the use of electricity for cooking and water heating during certain hours of each day. Fuel saving targets are to be established. Once again a long-suffering public is called upon to respond. Failing such response, then "other measures"—we quote from Mr. Attlee's statement—"however drastic, will have to be taken to ensure that the target is achieved." According to estimate, industry will be left short of 7,000,000 tons of coal, and there remains the crucial problem of the allocation of the coal available to the different industries—major and minor alike. We would stress "minor," because many less conspicuous industries produce components and raw materials without which the big industries, even if they have enough coal, are held up. In which connexion it is not sufficient to draw up a scheme of allocation in the back rooms of Whitehall.

The whole situation is bleak, and the fact stands out that the present shortage of coal and raw materials is such that our existing manpower cannot remain in full employment, in spite of the need for all classes of manufactured goods. We would note the pertinent comment of Sir William Larke, in an Address to the Midland Regional Conference of the Federation of British Industries, that technical investigation into the fuel consumption of every works (in spite of all that has been done in recent years and in the immediate past) will almost invariably result in further economies, though *such economies*—our own italics—*are only possible if coal of appropriate quality is obtainable for each purpose.* Small individual economies may seem unimportant, but in their total they may prove to be salvation. We were interested also in an "Interim Statement on the Economic Outlook" issued last week by the Grand Council of the F.B.I. This, in truth, is a "cold fact" statement, the Council roundly maintaining that paralysis had been creeping over the industrial system long before the great frost held up the movement of fuel and the supply of power. "Production was becoming increasingly entangled in shortages and each attempt to remove a shortage in one place caused shortages to appear in another . . . At the end of 18 months of reconversion British industry has reached a point at which it must either sort itself out or come to a standstill."

The "Interim Statement" to which we refer deals with sharp point with the coal situation. The quality of delivered coal has seriously deteriorated. The loss of calorific value compared with pre-war is not less than 5% taking the country as a whole, equivalent to 10,000,000 tons a year. The waste of manpower to handle this, of rail trucks to transport it, and of heat in attempting to burn it, is insupportable. Stocks of coal are 10,000,000 tons below a workable level. It is put forward that the 200,000,000 tons suggested by the Government is insufficient to support that industrial activity essential to meet export and other targets. In 1941 a labour force in the mines, equal to to-day's, produced 206,000,000 tons of good quality coal; since then there have been significant increases in mine mechanization. An increase of 35,000 manpower for the mines is planned, the while the Government's optimistic target is 200,000,000. The T.U.C., with motives best known to itself, regards a figure of 220,000,000 tons as only reasonable—again the while an alarmingly high rate of absenteeism in the pits persists. The banner "Higher wages; shorter hours" will be nailed to the coffin of hopes, certainly not to the mast of their fulfilment.

MANAGEMENT

WHEN we were younger than our greying locks proclaim us to be to-day we achieved the position of manager of a works. It was not a large works; the total labour force—men, women, and girls and the imps of mischief miscalled boys—was not greatly in excess of one hundred. Fired with technical enthusiasm we tackled with alacrity the task of putting the works into production, only to discover that that was the least of our worries. We should not have suffered this disillusionment had we had the benefit of reading Mr. Tate's Address to the London Juniors on "Management and Administration," because in one sentence Mr. Tate told his audience what we and many others have had to discover by experience: "While the mechanics of an enterprise can be developed on lines proved by experience, the problem of human relationship is transcendent." That is true of the management of a works, but for the management of a whole business the range is wider still. To quote Mr. Tate again: "Once the fundamentals of a business are grasped, success is dependent on human relationships, whether local with staffs and employees, or over a wider sphere of contact with those from whom the business derives its ability to exist."

The Management should be the captain of the team. It should be to the Management that everyone can look for a lead, and the Management must not disappoint those who depend upon it. "The Management" may be a single individual or a board or a gathering of heads of departments —but whichever it is, it must, even in this so-called democratic age, possess the power of leadership. We came through the war because we had great leaders. There are many who maintain that we are proving less successful in peace because of the absence of inspiring leadership. What is true of a nation or of an army is true of a business. A great responsibility rests upon the shoulders of management. It was very proper that Mr. Tate should emphasize in an Address to those who are not themselves managers some of the difficulties and underlying principles of management.

It may well be that Mr. Tate has undervalued the technical difficulties of management and has somewhat overvalued the difficulties that arise from personal relationship. If that criticism is valid, it is because in a gas undertaking or any other form of public utility there is not the same necessity for controlled adventuresomeness in commercial policies and for brilliance in the planning of new policies to cope with new situations which are essential in more private forms of enterprise. A business faced with decreasing demands for its goods, for example, can only survive if its leaders can successfully change their policy and perhaps even their manufacturing processes and products to keep abreast of the times. In the Gas Industry, for all the time during which Mr. Tate's managerial experience has lasted, the difficulty has been to supply the demand rather than to create a demand.

Under these conditions it is perhaps not altogether surprising that the bulk of Mr. Tate's Address dealt with the handling of staff and labour. Those problems have loomed large on the horizon of every management during the past few years, and particularly so in this difficult period of adjustment when we are changing from the patriarchal form of society favoured by Mr. Tate and universal only 50 years ago to a socialistic form of society—caused, we suggest, by the spread of "education." Nevertheless, it must be emphasized that, as Mr. Tate pointed out, there are five directions in which management must exercise responsibility—manufacture, sales, distribution, finance, and labour relations. It is necessary that management shall give full thought and attention to each one of these, and each one provides its own peculiar problems. It is remarkable that nowhere in his Address does Mr. Tate specifically mention technical skill as one of the attributes of a successful manager even of a gas undertaking. He regards the duties of management as comprising only "the conduct of the business on sound commercial lines and the maintenance of contentment among the employees." It is true that the non-technical manager can buy technical skill by engaging a good engineer. It is equally true, of course, that a good engineer or chemist is not necessarily a good manager.

CONTENTIOUS AND DANGEROUS GROUND

WHO then should manage an undertaking? Here we enter upon highly contentious and dangerous ground, because almost every individual in the country is certain in his own mind that he can manage the undertaking he serves quite as well if not better than those who do in fact manage it. Your Britisher, being in the main an individualist by tradition and upbringing, delights in criticizing those in authority. The management, like the Government—any Government that happens to be in power —comes in for a considerable share of criticism from everyone in the undertaking.

In many businesses there is a growing tendency to put an accountant into the managerial chair. The basis of this is the belief among many boards of directors that the principal purpose of any business is to make money. It is held that an accountant, being one whose trade is the handling of finance, is the best person to manage the business. We deprecate this attitude of mind. It may lead to the whole business being run as rigidly as the accountant of necessity controls his books and to an unwillingness to take the slightest risk in developing new products or processes involving capital expense. If an accountant, or a lawyer, or an engineer, or a chemist, or any one else—no matter to what profession he was trained—happens to possess the proper attributes for a manager, he should manage the business.

The lesson to be learned not only from Mr. Tate's Address but from many other publications and much recent experience is that management is a job of its own, a job for which special training is necessary and for which special qualities are needed. The training is not necessarily that of the lecture room; it should certainly not be confined to the lecture room. Those who are likely to become managers of departments or of undertakings should be picked out early and given a comprehensive training, under a schoolmaster whose name is Experience, throughout all branches of the company. The manager of a department must have technical knowledge of the work of his department. The manager of a whole undertaking must understand the basic principles of the industry and of the industries his undertaking serves; but he need not necessarily possess the skill to design a new works, to investigate chemical reactions, to keep the books, or even to sell his products to an unwilling customer.

LEADERSHIP

THE Manager, we have said, should be the leader, and if we now turn to leadership as it concerns personal relationships it must be understood that we do not consider this to be the only major problem of leadership. In some industries and in some firms it may not even provide the principal problems. To-day, labour problems fill a great deal of the manager's time. He is the leader of the team whose duty consists in keeping his team efficient and contented. That is no small problem, as the correspondence columns of the Technical Press show. The I.G.E. book, "Careers in the Gas Industry," has been roundly criticized as giving an idealized picture of the Gas Industry as it should be rather than as it is. That in itself shows that there are employees who are discontented and that there are managements who are not succeeding in keeping their staffs contented, and are to that extent themselves inefficient.

Staffs and workmen are human; so is the management. The way to manage men and women is to put oneself in their place. The bullying type of manager can never do this. He may drive, but he does not lead. Some time ago a paper, we believe it was an American paper, crystallized the distinction in seven contrasts. They are worth repeating for they add emphasis to much of what Mr. Tate had to say: (1). The Boss drives his men; the leader coaches them. (2). The Boss depends on authority; the leader on goodwill. (3). The Boss inspires fear; the leader inspires enthusiasm. (4). The Boss assigns the task; the leader sets the pace. (5). The Boss says, "Get here on time"; the leader gets there ahead of time. (6). The Boss fixes the blame for the breakdown; the leader fixes the breakdown. (7). The Boss makes work a drudgery; the leader makes it a game.

That is good; but it is not all. That is leadership in action; but there is also leadership in inaction. The leadership in inaction is the more difficult. It requires that men who are doing their work, sometimes not very exciting work, should still feel contented and even enthusiastic. What does the employee want? If we could answer that question and give it him we should have gone a long way towards industrial

efficiency. For it is certain that our major national problem to-day is one of getting people to work hard and enthusiastically and that at a time when the Trade Union leaders promise reduced working hours. What shall it profit a man if he plays twenty-four hours a day and does not eat?

Employees can be divided into three classes: unambitious; moderately ambitious; ambitious. We believe that the bulk of employees are in the unambitious category, and that goes for America as well as Britain. A recent American publication declared that seven out of every ten Americans put security of income above adventurousness in taking new jobs. The attitude of the wife has a great deal to do with this. If she is content to take a risk and inspire her man to do so, he is far more likely to be ambitious; but security and a steadily reliable existence is the general desire. That means that if a man's life is made interesting and his job is secured he will be contented. The co-partnership movement is one evidence of this; the little more in dividend, the interest it inspires in how the undertaking is prospering, and most employees are content to win the long-service medal. Mr. Tate clearly agrees with our experience for he says: "The desire for responsibility of any kind is often disappointingly absent."

There are also those who are keen to progress but who will never get very far. They will attend evening classes in their youth and they will fit themselves for a position of moderate responsibility. They may become the foremen, the technical salesmen, and sometimes attain as high as the deputy engineer of a small company; they are the accountants, the managing clerks; in short they are the senior staff, the backbone of every business, and equally of a gas undertaking. In many respects they are the salt of the earth, for they will take responsibility, though certain individual limitations, sometimes due to environment, prevent them from rising to the pinnacle of management. A great deal of the unrest which is undoubtedly prevalent in gas undertakings to-day is due to failure to give these men and women their chance. Too often they wait unnoticed, having no means of putting themselves forward, until they have grown grey. When promotion comes their way it is too late; they have ceased to care. The best leave to enter another industry. It is not the least of the duties of management to provide a stairway up which those who are moderately ambitious can pass to better jobs. There are managements who hold that because a man is doing his job well he should remain in it. That may be the way to lose him to another industry; it is no use writing Careers Booklets if we do not live up to them.

We observe with approval Mr. Tate's reference to the vertical form of authority, upwards and downwards, from the foreman to the general manager, which "may be slow and subject to complete obstruction in some link of the chain by personal failings—particularly where questions relating to personnel are concerned." He rightly observed "many of the aspirations for responsibility in management, which are possibly not so much what they appear to be, as evidence of an attempt to improve status." "Management," said Mr. Tate, "has a very real obligation to recognize this latent desire and it should be remembered that the personnel, being very much human beings, are not necessarily completely satisfied if they receive good wages and conditions, but yet feel themselves mere 'hands'." If this is true of the workmen, how much the more true it is of the staff. It is one of the fundamental duties of any management that wishes to keep its staff contented to watch for evidence of attempts to improve status by studying in spare time, and to watch for keenness to get on in the youngsters. Not to recognize this keenness in a tangible way by promotion and by other encouragement is to court disaster. To judge from some of the stories that reach us, there is small wonder that the Gas Industry is going out into the highways and by-ways to compel them to come into the Industry.

THE QUESTION OF ENCOURAGEMENT

THEN there is the thousandth man who is imbued with ambition to reach the top and has the necessary personal qualities to do so. Management must be on the lookout for him too. He will quickly be found among those who have education, or who are educating themselves. Men do not "scorn delights and live laborious days" for fun. The possibility of missing keen young men and allowing them to leave the Industry should encourage every manager to see that there is machinery for discovering and encouraging the ambitious.

The essence of the personnel side of management was summarized by Mr. Tate in a way which we shall not attempt to better. "It should always be the duty of the highest level to concern itself with subordinate views on working conditions and set an example that will inculcate the necessary enthusiasm for the job. Even employers who devote considerable attention to the human element in their businesses are surprised when good wages and conditions are not enough, and become definitely discouraged because, notwithstanding Sports and Social Clubs, Provident Clubs, Sick and Pensions Funds, and many other benevolent factors, their employees do not give of their best and remain uncco-operative. To fill a normal human need there must be more than these material things, and I feel the sense of doing something worth while and the knowledge that each man's work is dependent upon others who also depend upon him, are essential ingredients of industrial contentment. *How this is to be achieved is a problem of management which has no equal.*"

How is that problem to be solved? Mr. Tate did not say. He propounded the problem, but did not stay for an answer. One way is not to keep men doing the same job day after day unless they specifically wish to do so. The human race likes change. A medical man once told us to change round the pictures on our walls, because "it would give a new outlook on life." Another way is by personal encouragement. It would be no bad thing if the management would have a talk with every member of the undertaking at least once a year. Impossible? Perhaps in a big undertaking, but the personnel officer or a senior foreman could interview the weekly wage earners, and other senior officials could talk to the staff. Then again, the old pride of craftsmanship should be re-awakened. Do all workmen understand the job they are doing? Could they not be trained by talks and demonstrations to know why one way of doing a job is right and another is wrong? Are the workmen told of the working results each day so that they know what has been the result of their labours? We heard of American manager who was concerned about the output of his reheating shop. Without doing anything more than asking at the end of each shift what had been the number of heats and putting it on the furnace casing with a piece of chalk so engendered a spirit of friendly rivalry between his shifts that his output went up 50%.

We all learn by each other's experience; our columns are open to those willing to express their views on the vital question we have briefly discussed.

Electricity on Gas-works

A sequel to the complaint about electrical competition, particularly at Maidstone, which was raised at the January meeting of the Southern Association of Gas Engineers and Managers (Eastern District) was reported by Mr. J. D. C. Woodall at the March meeting. He had attended, with representatives of other industries, a meeting called by the Ministry of Labour at which they were asked to do everything possible to reduce the electricity peak load, and he was more or less forced to undertake to use his gas engine driven generator to help the Electricity Department out of its difficulties. It costs more to generate electricity in this haphazard way than to purchase it through the grid on an agreed basis. Mr. Woodall told his colleagues he

would not mind that, if it was going to help the situation, but the annoying thing was that electric heaters, cookers, and boilers were still being put into the Corporation houses. In an informal discussion which ensued it was pointed out that as part of the major fuel policy gas undertakings had in the past been urged to dispense largely with their own generating sets and take supplies from the grid, but gas engineers were now apprehensive about the maintenance of their supplies in view of the general cuts which were likely to be continued for some years. In the particular circumstances cited by Mr. Woodall it was felt that it would not be unreasonable for him to refuse to carry out the request unless there was some curtailment of the efforts to encourage domestic consumption. Mr. J. W. Townsend told the meeting that he had installed a diesel generating plant last year at Tunbridge Wells, and Mr. S. W. Hammond related how the Eastbourne undertaking generated its own electricity in the winter and took a grid supply in the summer. The general feeling appeared to be that gas engineers had enough worries without having to cope with lack of co-ordination between fuel and housing authorities.

Fuel Efficiency

Three days, Mar. 25, 26, and 27, were devoted in Glasgow to a wholesale Scottish Conference on Fuel Economy sponsored by the Ministry of Fuel and Power. In spite of paper shortage, innumerable documents, Government sponsored, of course, were issued for those attending or non-attending the Conference and Exhibition in connexion with this Scottish major event. We attended the Conference and its concurrent Exhibition, personally, and we learnt to our academic confusion that "Solid fuel burnt in efficient appliances for continuous heating of rooms, or of water, costs the householder about half as much as gas or electricity, and uses about half as much coal." This was B.C.U.R.A. To our mind, it is puerile misinterpretation of fact, and we were most disappointed, taking a reasonable view of the Exhibition as a whole, that gas was not strongly represented. It seems to us that the Gas Industry should and must anticipate, in its own interests and those of the community it serves, housing needs of local authorities and of public bodies generally. We feel that in this formal and paid for (via income-tax) conference and exhibition, the British Gas Council should have played a more prominent rôle.

Personal

M. GEORGES THEUNIS has resigned from the Board of the Imperial Continental Gas Association, but is retaining his contact with the Association's Belgian interests. Mr. E. F. DADSON has resigned from the Board and so from his office of Managing Director, and has been re-appointed General Manager.

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Mr. FRANK W. ALLUM, A.C.A., Secretary of the York, Harrogate and District Group of Gas Companies, has now been appointed Assistant General Manager. He will continue in his capacity of Secretary. Mr. Allum went to Harrogate from the Brighton, Hove, and Worthing Gas Company, in February, 1939, on the retirement of Mr. A. I. Seaton.

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Engineer Vice-Admiral Sir HAROLD BROWN, G.B.E., K.C.B., has been appointed Chairman of the Fuel Research Board in succession to Sir HAROLD HARTLEY, K.C.V.O., C.B.E., M.C. Sir Harold Brown has just resigned the post of Senior Supply Officer, Ministry of Supply. He was Engineer in Chief of the Fleet and during the war was Controller General of Munitions Production.

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By a unanimous vote the Edinburgh Public Utilities Committee has recommended that Mr. DAVID BEAVIS be appointed Deputy Gas Engineer and Manager in succession to Mr. D. D. Melvin, now Engineer and Manager. Mr. Beavis, a native of Glasgow, received his training in the Glasgow Gas Department, and was appointed Technical Assistant. He has also held positions at Helensburgh and Cambridge, and at present is Assistant Engineer at Cambridge. He received his technical education at the Royal Technical College, Glasgow, is an Associate Member of the Institution of Mechanical Engineers, and a Member of the Institution of Gas Engineers.

Hiding Its Light under the proverbial bushel on the stand of Bendix Home Appliances, Ltd., at the *Daily Mail* Ideal Home Exhibition was a Potterton No. 5 Emperor thermal storage set. The boiler, which had an hourly consumption of 120 cu.ft. and could supply 56 gall. of water per hour, was installed by Thomas Potterton (Heating Engineers), Ltd., to provide hot water for the four Bendix washing machines used for demonstration purposes.

Diary

Apr. 11.—North British Association of Gas Managers: Spring Meeting, Town Hall, Paisley, 10.30 a.m.
Apr. 14.—London and Counties Coke Association : Technical Committee, 2.30 p.m Gas Industry House
Apr. 15.—National Federation of Gas Coke Associations: General Committee, 10 a.m.; National Technical Committee, 11.30 a.m. Gas Industry House.
Apr. 15.—Solid Smokeless Fuels Federation: Technical Committee, Gas Industry House, 2.45 p.m.
Apr. 15.—British Gas Council : Central Board. Gas Industry House, 2.30 p.m.
Apr. 15.—Midland Junior Gas Association: "Distribution, Mainlaying, Servicing and Design of Distribution Systems," A. G. Addison (Birmingham).
Apr. 19.—London and Southern District Junior Gas Association: Visit to High Wycombe Works of the Uxbridge, Maidenhead, Wycombe, and District Gas Company.
Apr. 19.—Manchester and District Junior Gas Association: Visit to Stockport Gas-works. "Our Stake in Industrial Gas," T. H. Pardoe (Stretford).
Apr. 19.—Yorkshire Junior Gas Association: "Canteens in Industry," E. S. Carter (Halifax). Britannia House, Bradford, 2.30 p.m.
Apr. 21.—London and Counties Coke Association. Finance Committee, 11 a.m. Executive Committee, 11.30 a.m. Central Committee, 1.30 p.m. Gas Industry House.
Apr. 24.—Industrial Gas Development Committee, Manchester, 10 a.m.
Apr. 25.—London and Southern District Junior Gas Association: "The Woman's Point of View," Miss Maywen Godby. Gas Industry House, 7 p.m.
Apr. 29.—Midland Junior Gas Association: Annual General Meeting, followed by Address, "New Methods and Materials for House Construction," A. G. Day (Building Research Station).
Apr. 29.—Southern Association of Gas Engineers and Managers (Eastern District): "Mechanized Accountancy and Statistical Work as Applied to a Gas Company," J. D. Thomas (North Middlesex Gas Company). Gas Industry House, 2.30 p.m.
May 1.—Solid Smokeless Fuels Federation: Executive Committee Dorchester Hotel, Park Lane, 11.30 a.m.
May 9.—Manchester District Association of Gas Engineers: Annual Meeting and Luncheon, Midland Hotel, Manchester,
May 22-23.—Eastern Association of Gas Engineers and Managers: Spring Meeting, Chelmsford.

Industrial Design at the Housing Centre

At the Suffolk Street Housing Centre's Tuesday Lunchtime Lecture last week, Mr. Alan Jarvis gave an informal talk on the work of the Council of Industrial Design.

Mr. Jarvis, who was introduced by Mr. Leslie Hardern, Public Relations Officer of the Gas Light and Coke Company, explained how the work of the Council was helped by the generous Treasury grants resulting from the needs of the present export drive. He said that one of the aims of the Council was to narrow the breach existing at present between technical colleges and art schools, and he deplored the fact that there had never been a proper School of Industrial Design in Great Britain. The effect of the "Britain Can Make It" Exhibition on manufacturers had been one of stimulation, and this was the first time that exhibits had been chosen by a body such as the Council and not by the makers—a fact which had added greatly to the prestige of exhibitors. This had helped considerably to make manufacturing firms more design-conscious.

Arrangements Have Been Concluded for Grangemouth Town Council to purchase a bulk supply of gas from Falkirk. Early last year it was realized that the output of Grangemouth gas-works would require to be considerably augmented to meet future demands. Proposals were formulated which involved expenditure of some £35,000 for the addition of retorts. In view of the projected nationalization of the Industry, however, permission to proceed with the scheme of extension was not sanctioned and it was ultimately agreed to negotiate with Falkirk for a bulk supply. Grangemouth will pay an annual sum of £1,025 to meet the expenditure involved in laying a 12 in. main from Falkirk to the gasholder at Grangemouth. Estimated capital cost, including all auxiliary equipment, is £10,000, which it is proposed to borrow. Grangemouth will pay for gas currently used at the rate of 2s. 11d. per 1,000 cu.ft.

News in Brief

Consumption of Gas at Darlington showed an increase of 22½% for the 11 months ended Feb. 28, compared with the corresponding period of last year.

Mr. Robert MacLaurin, who has advanced proposals in recent years for gas production by distillation processes, is discussing with fruit growing interests in Lanarkshire the possibility of a scheme of cheap gas supply to the farmers there. The proposals are independent of local authority backing.

Skegness Urban District Council has approved the estimate of the Gas Engineer for the lighting of a new traffic roundabout at Lumley Square. The scheme provides for Class A lighting along the main artery, for which "London" lamps are to be used, and Class B standard for the lighting of the secondary routes.

The Ministry of Fuel and Power has sanctioned the first part of the Skegness Gas Department's scheme estimated to cost £2,000, for the extension of gas mains at the extremities of the district, to provide for housing developments. The Council has approved expenditure of £2,600 on the second part of the scheme, which provides for a high pressure supply to the north end of the town.

Mr. Arthur Forshaw has just concluded a tour in Scotland. In a series of six addresses, delivered at various centres between Hawick and Aberdeen, he talked to representatives of 22 gas undertakings on modern gas appliances made by R. & A. Main, Ltd. Recent improvements to cooker ovens and hotplates, and to water heaters, were particularly dealt with.

Parts of the Premises of the F. C. Construction Co., Ltd., at City Road, Derby, were wrecked by fire during the night of Mar. 26, and current records of the firm, which is engaged on contracts in all parts of the country, were almost completely destroyed. Mr. A. E. Butland, General Manager, asks us to state that the Company would be pleased if all those firms and individuals who are expecting communications would send further copies of their letters.

The Appeal of the Belfast Gas Department to consumers to "go easy" on gas consumption has met with a good response, and the position, while still requiring the closest attention and care, is reassuring. City street lighting has been cut down to a minimum and full advantage has been taken of the lengthening hours of daylight. The utmost care is being observed in Londonderry, Coleraine, Ballymena, Lurgan, Armagh, Newry, Lisburn, and other centres of industry in Northern Ireland.

For the First Time in over a hundred years' history, gas making had to be suspended for several days at the works of the Windsor Royal Gaslight Company during the recent floods. Feeling that this had been a particularly unpleasant and hard blow for Mr. J. G. Abbott, the Engineer and Manager, his colleagues of the Southern Association of Gas Engineers and Managers (Eastern District) sent a message of sympathy and encouragement to him from their meeting on Mar. 25.

To Ensure Next Winter's Gas Supply Chesterfield Corporation is putting forward to the appropriate Government Departments a scheme which will provide for the installation of ancillary plant and purifiers at Grassmoor Colliery and additional by-product plant at Hardwick. The scheme, if adopted, is estimated to bring about an increase in coke oven gas from these two collieries of from two to three million cu.ft. a day.

The Association of British Chemical Manufacturers has now secured accommodation for its branch office in India at Janmabhoomi Chambers, Fort Street, Ballard Estate, Bombay, 1. The object of the branch office is to foster Indo-British trade and goodwill in the chemical industry. The Branch Manager (Mr. A. St. J. Shuttleworth, O.B.E.) will be glad to hear from anyone in India who may require guidance, in particular on sources of supply of chemicals. He will also be performing services in India for British chemical manufacturers.

With Two or Three "Extremely Difficult" Winters to face before Accrington District Gas and Water Board is in a position with new plant to supply public requirements, the Manager (Mr. A. Harrison) on Mar. 27 reported negotiations with the Ministry and the National Coal Board, new owners of coke oven plant at Altham, to increase supplies. When final details are settled he gives the warning that it will take three or four years to develop a scheme, due to long delay in delivery of plant. Gas output was now greater than ever, being 66% up on 1938-39.

Unsuccessful Efforts have been made by the Scottish Iron and Steel Confederation to keep the blast furnaces and by-product plant at Shotts in production. The furnaces, which employ 200 men, are to close down, and notices to this effect have been posted by the owners, the Shotts Iron Company. The furnaces were to close down on Jan. 1 last, when the Company's pits were taken over by the National Coal Board. It was uneconomical to keep the furnaces going without a Government subsidy. A three month's reprieve was then arranged, but fuel consumption far exceeded the amount of pig-iron being produced. Almost 1,000 tons of pig-iron were being produced per week at the Shotts blast furnaces, which have been in operation since 1802.

Bad Weather has delayed the completion of the Newcastle and Gateshead Gas Company's new gasholder at South Gosforth from six weeks to two months. It has cost £115,000 and more than two years of engineering skill and will increase storage capacity by 3,000,000 cu.ft. or 12% of the existing total.

The Trade Statistics for November, 1946, just issued by the Department of Industry and Commerce in Eire, show imports of 20,259 tons of gas coal, valued at £61,007, as against 18,591 tons, valued at £55,754 in November, 1945. This brings the total of these imports for the first 11 months of 1946 to 245,521 tons, valued at £723,772 as against 188,080 tons, valued at £532,029 in the year 1945.

Work has Commenced on the construction of the Council's new Embassy Restaurant at Skegness, at an estimated cost of £7,200. The building will be provided with gas-fired central heating, and air-conditioning plant, and the restaurant is designed to cater for 600 people. The kitchen will be supplied with gas equipment designed by Radiation, Ltd., and installed by the Gas Department.

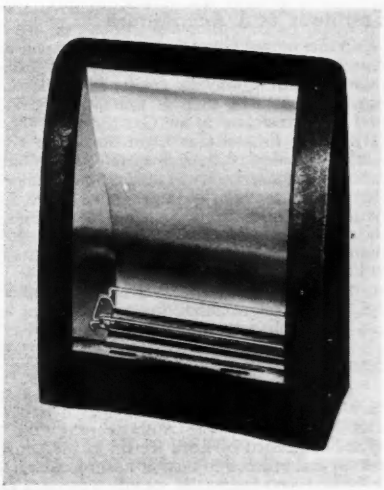
Arrangements are well advanced for the 11th Public Works, Roads and Transport Congress and Exhibition which is to be held under the patronage of H.M. the King and under the presidency of the Minister of Health at Olympia, London, from July 21 to 26 next. The Congress and Exhibition have not been held since 1937 and there is evidence, the organizers state, of considerable interest in their revival.

The Price of Gas in the area of the Wandsworth and District Gas Company has been increased by a penny per therm as from the first meter readings and collections this month. The Company has also announced an increase in the declared calorific value from 500 to 520 B.Th.U. from April 1. A similar increase in declared calorific value is announced by the Woking District Gas Company.

The Timely Arrival of gas coal and coke last week averted a complete failure of Dublin's gas supply. At a meeting of the Alliance and Dublin Gas Consumers' Company on Mar. 27 Sir James McMahon, Chairman, said that but for coke and gas coal then on the way from England the Company would have been compelled to announce that day the almost immediate cessation of gas supply in the city, which would have resulted in much hardship and loss.

Acticarbon, Ltd., 175, Piccadilly, London, W.1, announce that the name of the Company has been changed to the British Ceca Co., Ltd. The address remains the same. The change has been made to bring the name in the British Empire into line with the world-wide organization of Ceca (Carbonization et Charbons Actifs), of Paris, whose patented and technical processes are used. The plants for solvent recovery by the "Acticarbone" process, for electrostatic precipitation by the "Actifilter" process and for air drying by the "Actisec" process, are all British made and the combined technical experience of the Ceca group, with affiliated companies in other countries, is available. The activated carbon "Acticarbone" for solvent recovery is being produced in this country and more extensive factory premises have been acquired for this purpose. Large developments are also in hand for the sale of finished materials of North African origin, produced by Ceca, such as activated earths, betonites, kieselguhr, and filter aids.

The "Miligas" Fire



Illustrated is a new portable gas fire developed by the Research Department of Midland Industries, Ltd. The screen is made of stainless steel and operates at a red heat; can easily be removed for cleaning, when necessary, by pulling the guard rod and screen assembly out of the clips in the reflector. The screen has a gas consumption of 10 cu.ft. per hour, and the general design ensures that the fire is completely safe when standing on carpets or linoleum. We are given to understand that the manufacturers can offer delivery within a very short time.

Junior Associations' Activities

THE earnestness and enthusiasm with which the Junior Gas Associations have approached their technical, administrative, and commercial problems during the session now nearing its close is generally regarded by the seniors as a happy augury for the future of the Industry. The following brief summary of the contents of the April issue of "GAS" is typical of what the Juniors have been saying and doing. It will be noted that such important events as the London Juniors' Convention are not mentioned—space considerations necessitate their deferment until a later issue.

Tar and Benzole Distillation

A report of the discussion on the Paper (published in the March issue of "GAS") on "Distillation of Tar and Benzole" by R. Scott (Midland Tar Distillers, Ltd.) to the Midland Junior Gas Association, clarifies many of the points raised in the Paper. Several speakers referred to the increased difficulties in separating water from water gas tar, and one of them said he was considering putting in a separate tank in which the tar could settle. The Author regretted to hear that water gas tar was being bulked with other tar, but had no data on the effect this had had on the percentage of water in the bulked crude; nor had he any data on the rate of separation of emulsions from water gas tar. He saw no objection to a separate tank to allow the tar to settle, but suggested that it would be better to warm it to assist settling.

Leakage from Distribution Systems

The second half of the Paper by C. D. Shann, Assisting Distributing Engineer of the Gas Light and Coke Company, on "Some Investigations on Leakage from Distribution Systems" to the London and Southern District Junior Gas Association, with a full report of the discussion, completes an absorbing story of London's great distribution system and the problems involved in limiting the amount of unaccounted-for gas. The discussion evoked contributions—almost Papers in themselves—from the Distribution Engineers of the South Suburban, Tottenham, Croydon, and South Metropolitan Companies, which, while differing substantially in detail and experience, served to show how the whole Greater London area, sparsely populated as well as fully built up, is handling the leakage problem and restricting unaccounted-for gas to remarkably low proportions.

Sulphur Removal

Basic causes of the formation of organic sulphur compounds in town gas, and the past, present, and future development of methods of dealing with them, with particular reference to the Holmes-Maxted catalytic hydrogenation process and the development of the full-scale experimental plant at Mirfield, Yorkshire, are reviewed in a Paper by J. J. Priestley and H. Q. Marris (W. C. Holmes & Co., Ltd.) on "Removal of Organic Sulphur Compounds in Town Gas" to the Scottish Junior Gas Association (Eastern District). Their bibliography should in itself provide a wide field for study, while the latest information as to the results obtained at Mirfield and the notes on the condition of the plant after two years' operation, afford practical evidence of the successful application of the system to which the Paper is more particularly directed. Finality has by no means been reached, and the Authors refer briefly to further experiments now proceeding in other directions.

Engineer and Accountant

No one knows how the Gas Industry will be organized if and when it is nationalized, but it is unlikely that, except in the largest undertakings, there will be any greater separation of technical and accounting responsibilities than at present. The Paper on "The Engineer and the Accountant in the Gas Industry," read by R. Thomas, Secretary of the Bilston Gas Light and Coke Company to the Midland Junior Gas Association, is therefore of interest in that it relates the intimate links necessary in the existing smaller undertakings with those that will be essential in larger units. One thing that can be said for nationalization is that it would enable accounting work to be centralized in large units, where mechanized accounting could be used to a maximum degree. Hitherto the Gas Industry has suffered from a parochial outlook and the benefits of comparisons of working have been lost to many undertakings. This has contributed to wide differences in policy between neighbouring undertakings with regard to prices of gas and appliances.

Space Heating

"Some Aspects of Space Heating" are discussed by K. G. Eccleshare and F. J. Johnson (Bristol) in a Paper to the Western Junior Gas Association. The Authors recall the "reversed refrigeration cycle" suggested by Lord Kelvin in 1882, involving the use of a heat pump, and proceed to district heating, which "has much to commend it" but, to be financially sound, "depends on a very high consumption over a confined area," and to space heating by gas in the home and factory. They refer to the use of the "degree day" as a means of (*a*) providing a basis for calculating annual heat requirements of buildings; (*b*) providing a fairly rapid "climatic correction" when computing fuel consumption; and (*c*) predicting the fuel consumption of large and small heating plant. Degree days should not be used for either short period tests or for heating plant of the combined type when a single boiler supplies both the heating and domestic hot water system. In all cases daily degree days can be misleading, and it is recommended that a monthly figure is the shortest period that is likely to give reliable results.

Industrial Heat Treatment

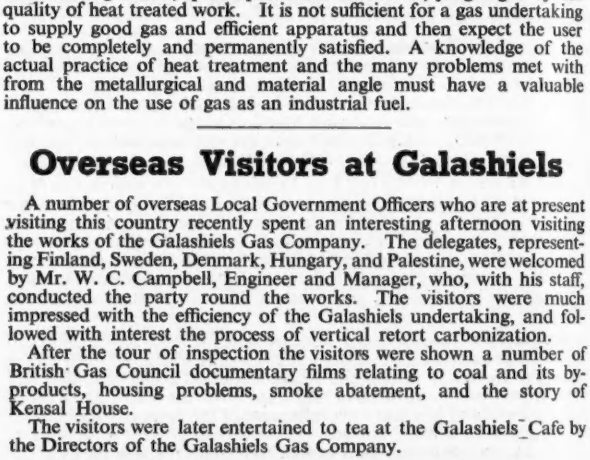
Another valuable addition to the contributions from the Birmingham Industrial Gas Department is a Paper on "Industrial Heat Treatment," which L. D. Creedy, Superintendent of the Heat Treatment Section, gave to the Midland Junior Gas Association. So far as the Gas Industry is concerned industrial heat treatment is extremely important, for the greater part of the industrial load is used for some form of metal heat treatment. Furnace and burner designs must be such that the heat application is uniform, easy to control, and economical and generally efficient, and a further aspect which experience of industrial practice has emphasized is a psychological one, in which a gas user, quite apart from economics, judges gas by the quality of heat treated work. It is not sufficient for a gas undertaking to supply good gas and efficient apparatus and then expect the user to be completely and permanently satisfied. A knowledge of the actual practice of heat treatment and the many problems met with from the metallurgical and material angle must have a valuable influence on the use of gas as an industrial fuel.

Overseas Visitors at Galashiels

A number of overseas Local Government Officers who are at present visiting this country recently spent an interesting afternoon visiting the works of the Galashiels Gas Company. The delegates, representing Finland, Sweden, Denmark, Hungary, and Palestine, were welcomed by Mr. W. C. Campbell, Engineer and Manager, who, with his staff, conducted the party round the works. The visitors were much impressed with the efficiency of the Galashiels undertaking, and followed with interest the process of vertical retort carbonization.

After the tour of inspection the visitors were shown a number of British Gas Council documentary films relating to coal and its by-products, housing problems, smoke abatement, and the story of Kensal House.

The visitors were later entertained to tea at the Galashiels Cafe by the Directors of the Galashiels Gas Company.



Mr. Hassan, the Palestine delegate, on behalf of his colleagues, thanked Mr. Campbell and his Directors for extending the invitation to visit the works, and for their hospitality. He said they had found their visit most interesting, and he was sure his colleagues would carry back to their own countries happy memories of their visit.

Mr. Campbell, in replying to the vote of thanks, said that no doubt they were aware that this country was in the midst of a fuel crisis at the present time, and that the Gas Industry was going through a very difficult period. He was glad they had found their visit interesting, and that they had had an opportunity to see for themselves how the Gas Industry in this country, by its method of carbonizing coal, not only made gas and coke, but also saved the valuable by-products, and at the same time helped to eliminate the smoke nuisance. Mr. Campbell also briefly referred to the literature which had been made available for them, and which gave an outline of the British Gas Industry.

The Gas Industry *vis à vis* the Coke Oven Industry

[From a Special Correspondent]

Continued from p. 36)

Benzole Recovery

Plants for the recovery of benzole are standard on coke oven works—for the very good reason that coke ovens are operated for the production of a particular type of coke and the maximum recovery of by-products. Gas-works, however, operate with a view to satisfying the public demand for gas, and the removal of benzole represents a "loss" of gaseous therms which must be overcome by carbonizing more coal. The recovery of about 3 gall. of benzole, equivalent to almost 5 therms of gas per ton of coal, means a corresponding increase in the quantity of coal to be carbonized and an additional quantity of coke to be sold. Besides, the removal of benzole from gas involves a reduction in calorific value of the raw gas and therefore in the proportion of diluent gas required to break down the undiluted gas to a declared calorific value. If dilution is by means of producer gas or water gas the reduced quantity of gaseous therms required as diluent has to be compensated for by the carbonization of more coal.

When, however, the carbonizing capacity is available and the additional coke can be disposed of at an economic price the installation of benzole recovery plants can be looked upon as an additional consumer of gaseous therms of considerable importance.

Such factors as these militated against the installation of benzole plants on gas-works for many years until the advent of the Government guaranteed preference in favour of home-produced oils. Benzole recovery then became a possible source of profit and during the last war it became necessary to achieve the maximum recovery from all gas-works.

On coke oven plants it is the general practice to heat the ovens with coal gas and dispose of the unwanted surplus to gas undertakings or other users if possible. Consequently the value of the gas as compared with that produced at gas-works has been relatively lower and the economics of benzole recovery were favourable. Also the quantity of coal carbonized at coke ovens ensured that plant of a reasonable capacity and with a steadiness of output could be installed.

At both coke ovens and gas-works a small proportion of the benzole produced by carbonization comes down with the tar, and the quantity so condensed depends on the degree and method of cooling employed. It is customary in both branches of the carbonizing industry to institute benzole recovery at the last possible stage of gas treatment. Thus, on gas-works, benzole plants are installed after the dry purification process for the removal of hydrogen sulphide and at coke ovens, where dry purification is only sometimes practised, benzole recovery takes place after the absorption of ammonia.

Methods Employed

The two principal methods for the recovery of benzole are by oil washing and by adsorption in active carbon. The washing units used may be either tower scrubbers packed with a suitable filling, static washers, which are essentially a number of small tower scrubbers in series with rapid recirculation of the washing medium in each stage, and rotary washers. The choice of unit is dependent on the quantity of gas to be treated, among other things, for, with tower scrubbers, the lower limit of size is governed by the ability to obtain adequate flushing of the packing with the optimum oil circulation. Regeneration of the benzolized oil is generally obtained by distillation with steam at normal pressures, but a recent development becoming adopted by the Gas Industry is the use of vacuum distillation with steam. The still, which may be of the convential bubble tray type, is maintained under a vacuum of 20 in. mercury and operates with a considerable saving in steam consumption, figures of under 20 lb. per gall. of benzole being reported. The type of oil used on gas-works for the recovery of benzole is almost invariably gas oil, mainly because it is free from naphthalene, but it is also the most suitable oil for carburetting purposes on water gas plants after it has been rejected from the benzole recovery plant. A few plants on gas-works operate with creosote oil, but in these instances it is necessary either to install washers using gas oil after the benzole washers or to steam the benzolized creosote oil heavily in order to prevent naphthalene going forward with the gas. On benzole plants with vacuum stills there is a marked reduction in the formation of sludge in the gas oil used and this has been attributed to the low temperature—80° to 90° C.—to which the oil has been heated before passing to the still. On atmospheric plants the oil is heated to 120° to 130° C.

The active carbon process for benzole recovery has made some progress in the Gas Industry, but the number of units installed has been relatively few. The largest unit is at the Beckton Works of the Gas Light and Coke Company, this being the largest benzole recovery plant in the world.

Benzole recovery at coke oven plants is entirely by oil washing, no active carbon plants for this purpose having been adopted as yet. The type of unit used is generally the tower scrubber, possibly because of the greater quantity of gas available for treatment than is produced at most gas-works. The oil generally favoured is creosote, usually with a drip point slightly above 200° C. and distilling not more than 90% at 300° C. Such creosote oil contains naphthalene, but its presence is of minor importance in coke oven gas which is not sold for distribution by gas undertakings. The naphthalene is said to confer beneficial characteristics to the wash oil which are favourable to benzole absorption. Creosote oil has also been preferred in the past to gas oil at coke oven plants because of the fewer troubles experienced with the sludges produced from tar-fog constituents. These compounds are less soluble in gas oil, possibly on account of their benzenoid nature. Creosote oil therefore thickens considerably in use with increase in specific gravity and viscosity, but deposits less sludge. With the extended use of electro-detarrers for the removal of tar fog and the greater attention being given to the quality of gas oil greater use of these oils is now being made by the Coke Oven Industry, but sludge formation has not been eliminated. Even with electro-detarrers, the tar-fog content of gas treated at coke ovens for benzole recovery is greater than that of gas leaving dry oxide purifiers for benzole recovery as in standard gas-works practice. It should be noted, too, that gas passing through benzole washers at coke ovens contains hydrogen sulphide and hydrogen cyanide, whereas at gas-works it contains no hydrogen sulphide and only a little hydrogen cyanide and ammonia.

In conclusion, the differences in typical characteristics of the crude benzoles produced by the carbonizing units of gas-works and of coke oven plants may be noted.

	Horizontal retorts and coke ovens	Intermittent vertical chambers	Continuous vertical retorts
Analysis of benzole—	%	%	%
Forerunnings	4	5	6
Benzole	73	55	50
Toluole	15	20	20
Xylole	5	12	14
Residue	3	8	10
Specific gravity	0.87	0.84	0.82
Saturated hydrocarbons	6	15	20
Unsaturated hydrocarbons ...	4	8	10

They reflect the cracking conditions under which the crude benzoles have been formed. Variations in temperature and time of contact in any one system will, of course, produce benzoles of different characteristics.

Sulphur Recovery

By Act of Parliament it has been made obligatory on gas undertakings to absorb hydrogen sulphide from gas sold to consumers to such low limits that virtually 100% removal is required. The well-known dry process using iron oxide from one source or another for this purpose has stood the test of time up to the present. The only changes which have occurred have been in the design of the unit with a view to improving the efficacy of the process and reducing handling costs.

At various times methods have been developed in other countries and sometimes by industries other than those of coal carbonization for the absorption of hydrogen sulphide from gases by liquid reagents. Copious references to these continuous processes have been made in the Technical Press at various times, but no investigation has yet revealed that a change by the Gas Industry from the established dry purification process can be justified.

At the present time coke oven plants have no incentive to remove hydrogen sulphide from gas unless they are compelled to do so by agreement with public utilities purchasing surplus gas from them. Usually only sufficient plant of the dry purification type is then installed to deal with the gas thus sold. There may, however, be special considerations at some coke oven plants where it is desirable to remove all hydrogen sulphide from the gas.

If it is necessary to remove sulphur from all the gas produced at even the average size of coke oven the low gas space velocity of the dry purification process necessitates the use of a big plant. Wet purification processes are generally lower in capital cost and occupy far less ground space, although they are more complicated in detail and entail costs for repairs and maintenance. It would therefore seem that there is scope for investigation and development of such processes for application to coke oven gas if and when more extensive use is made of such gas for linking up with gas grids for area supply.

Miscellaneous Processes

There are certain processes peculiar to the Gas Industry which have not been adopted by the Coke Oven Industry because of the lack of incentive.

Gas undertakings have found by experience that it is desirable to remove naphthalene from gas in order to maintain a satisfactory service to consumers, and where benzole plants have not been installed this operation is performed by washing the gas with oil, generally in rotary washers.

A further refinement in the provision of a satisfactory service has been the partial removal of water vapour from gas leaving the holders.

Several processes have been developed for this purpose, of which that using a suitable calcium chloride solution is the most common.

The desire to reduce sulphur to a practical minimum has inspired the installation of plant for the removal of carbon disulphide in the past, the well-known Carpenter-Evans process being the outstanding example. Further intensive research, however, has been undertaken in recent years to develop a less costly process.

Gas, Tar, and Ammonia

The volume of gas obtained per ton depends on the coal carbonized, but for the same coal it can be said that the higher the yield the lower is the calorific value.

The characteristics of the gas obtained by carbonizing coal in horizontal retorts and in coke ovens are rather similar in most respects. The gases obtained from vertical retorts, both intermittent and continuous, are higher in both hydrogen and carbon monoxide and lower in methane; consequently they have a lower Hydrocarbon Enrichment Value (H.E.V.).

The tars from horizontal retorts and coke ovens are generally of 1.10 to 1.20 specific gravity and contain 60 to 70% of pitch. Those from vertical retorts are lighter, contain less free carbon and naphthalene, and have a pitch content of 50 to 60%.

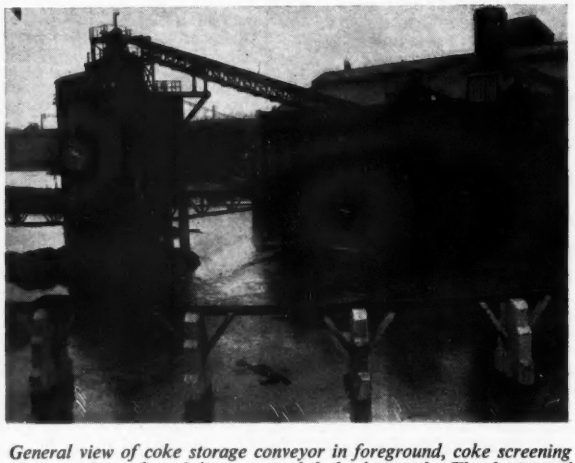
The yields of ammonia are generally lower from horizontal retorts and coke ovens than from vertical retorts.

Thus the different conditions of carbonization obtaining in horizontal retorts, vertical retorts, and in coke ovens are reflected in the yields and characteristics of the various products. As the choice of plant is governed largely by the yields and properties required for the two main products—namely, gas and coke—it is necessary to have some knowledge of these characteristics.

(To be continued)

Floods at Watford Works

Heavy rain, following the sudden thaw, caused the River Colne to rise rapidly on Mar. 12, and on the following day it overflowed its banks, and at 4 p.m. water was flowing into the works of the Watford and St. Albans Gas Company. The level of the water rose rapidly, and by 6 p.m. there was 2 ft. of water around the retort houses. The coal plant and coke plant receiving hoppers were completely filled with water. The primary air slides and the main openings from the waste gas flues to the main flue were covered in water. Small holes at the top of the producer doors were opened or the producer doors cracked in an effort to keep the furnaces alight. The water continued to mount rapidly and by 7 o'clock on the morning of Mar. 14 there was 4 ft. of water in the retort houses. The producer doors were almost completely immersed and it appeared that if the flood continued the producer fires would rapidly die out; the main flue must have been completely under water.



General view of coke storage conveyor in foreground, coke screening plant, and reinforced hoppers in left background. The horizontal retort house is in right background

Loud speaker vans were sent around Watford, Bushey, Rickmansworth, and Chorley Wood, informing the public of the serious situation and telling them what to do should the supply fail.

To add to the anxiety the inlet and outlet mains on No. 4 holder, which was full of gas, completely sealed off at about 7 a.m. and it was difficult to get into the valve house as the decking was floating in deep water. However, by a man entering from the roof of the valve house and sitting astride planks which had been placed through the window on to an angle curb on the holder it was found possible to operate hand pumps, which cleared the inlet syphon in about an hour and a half.

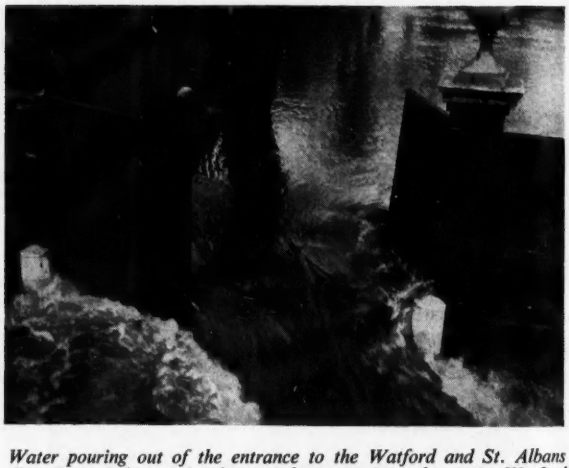
In the meantime, No. 3 holder had been opened up on the town. The gas supply did not fail as this was done before No. 4 holder completely sealed off.

It was not possible to elevate coke to the carburetted water gas plant as the water level was 4 ft. above the top of the receiving hopper. To keep the plant going coke was hauled up on to the stage floor in sacks. This continued for about 36 hours. During the nights of Mar. 13 and 14 a number of retorts were discharged and re-charged, the coke being quenched on the stage floor or fed to the producers, where possible.

By the afternoon of Mar. 14 the floods commenced to subside and by 5 o'clock the level had dropped by about 18 in. The Assistant Works Engineer, Carbonizing Foreman and two men took a punt, which is kept on the works, and managed to enter the retort house, opened up the producer doors and pricked up the fires. It was as much as they could to to punt against the swift flow of water through the works. In the same way they visited the concentrated liquor plant and shut off the controls, and vented the waste heat boiler.

The repair shops and garage were under about 2 ft. of water, which was pouring out of the various works gates in a torrent across the main High Street, which was flooded to a depth of about 3 ft. By about 4 a.m. on Mar. 15 the floods had sufficiently subsided to enable the fire pumps to get to work on the various pits.

Heats in the retort houses gradually improved as the main flue dried out, and by the afternoon of Mar. 16 charging and discharging had reverted to nearly normal. It is difficult to ascertain the extent of the damage, if any, to the retort house firebrick work, but from outward appearances it would not appear to be great. In the repair shops a large number of meters and appliances were under water and a considerable amount of repair work must now be done to these appliances.



Water pouring out of the entrance to the Watford and St. Albans Gas Company's repair shops and garage into the main Watford High Street

The whole of the Company's staff involved in the flood put in really splendid work. The Foremen were walking about in ice cold water up to their waists and everybody was anxious to help in maintaining some gas production. Employees at the Company's St. Albans works offered to come over and lend a hand after their day's work and their offer was gladly accepted in some cases. The Company's auxiliary fire service got to work promptly and worked continuously for five days. Without their help it would have been impossible to resume production so quickly. The Company is also indebted to the Wandsworth Gas Company who offered to send mechanics to assist with repairs and who sent five trailer pumps to help with the pumping.

Speaking at the Annual Meeting of the Stirling Gaslight Company, Mr. J. F. Millar, Chairman of Directors, expressed alarm at the delay in receiving additional gas-making plant, which, he said, gave cause for anxiety for the maintenance of adequate gas supplies in Stirling. Gas consumption in the burgh had increased in the last year by 8% thus taxing the works to the limit of their capacity. Mr. Millar emphasized the necessity for greater economy by consumers.

Low Ash Coal in Carbonization

[From a Special Correspondent]

(*Continued from p. 39*)

FOR the purpose of ascertaining the advantage of using low ash coal on a worked basis, the following data may be found interesting:

TABLE II

Coal A containing 4% ash and 4% moisture. Good gas coal. Steaming 30%.

	£ s. d.
One ton coal @ 56s. d/d, 4% ash..	2 16 0
Less residuals—	£ s. d.
Coke sold, 10.3 cwt. @ £3 per ton	1 10 10
Breeze sold, .9 cwt. @ £1 per ton..	10.8
Tar, 18 gall. @ 4d. per gall.	6 0
Liquor, 40 gall. as sulphate, manufacturing costs deducted	7.5
Benzole, 1 gall. @ 1s. 6d. per gall.	1 6
Returns for products	£1 19 10.3

Cost of coal £2 16 0, less residuals £1 19 10.3 = 16s. 1.7d. net cost of coal.

Make per ton, 18,220 cu.ft. of 450 C.V. gas. 30% Steaming.

	Cost per 1,000 cu.ft. d.	Cost per therm d.
Gas	10.63	2.365
Purification	.55	.122
Salaries and wages	3.25	.722
Wear and tear	5.50	1.222
	19.93	4.431

Total cost of gas into holders per ton of coal carbonized = 18,220 cu.ft. × 19.93d.	£1,513
By sale of 17,127 cu.ft. of gas at 5s. per 1,000 cu.ft. ..	£4,281
Ratio of cost of coal, as gas, to revenue/ton, as % age..	35.34%
Therms sold per ton = 77.15 = 13.33d. per therm ..	£4,281
Leakage allowed	.6%
Ratio of gross cost of coal, to revenue per ton	65.34%

N.B.—Steam required is presumed to be generated in waste heat boiler.

Thermal Balance

	Therms
1 ton coal yield 18,220 cu.ft. × 450 C.V. gas ..	82.000
10.3 cwt. coke @ 12,500 B.Th.U./lb.	144.00
.9 cwt. breeze @ 10,000 B.Th.U./lb.	10.00
18 gall. tar, sp. gr. 1.07 @ 16,000 B.Th.U./lb.	30.81
1 gall. benzole, sp. gr. 0.878	1.58
	268.39

Debit .. Coal 310 therms/ton. Credit .. 268.39 or 86.57%

	Yield %
Gas	26.46
Coke	46.46
Breeze	3.20
Tar	9.94
Benzole	0.51
	86.57%

Thermal efficiency of gas production equals 66.35%

Thermal efficiency of gas and residuals manufactured 86.57%

Lb. steam used/ton coal = 672 lb.

TABLE III.—*Single Stage Vertical Retort Plant with Steaming* Coal B containing 8% ash and 4% moisture. Gas coal. Steaming 22%.

	£ s. d.
One ton coal d /d @ 52s. ton), 8% ash	2 12 0
Less residuals—	£ s. d.
Coke sold, 9.5 cwt. @ £2 12s. per ton	1 4 8.4
Breeze sold, 1 cwt. @ 18s. per ton	10.8
Tar, 16 gall. @ 4d. per gall.	5 4
Liquor, 35 gall. as sulphate net costs deducted	7.5
Benzol, 1 gall. @ 1s. 6d. per gall...	1 6
	£1 13 0.7

Cost of coal £2 12 0, Residuals £1 13 0.7 = 18s. 11.3d. net cost of coal.

Make per ton 16,880 cu.ft. of 450 C.V. gas 22% steaming.

	Cost per 1,000 cu.ft. d.	Cost per therm d.
Gas	13.46	2.984
Purification	0.56	.1243
Salaries and wages	3.25	.723
Wear and tear	5.52	1.228
	22.79	5.0593

Total cost of gas into holders per ton of coal carbonized = 16,880 × 22.79	£1.603
By sale of 15,867 cu.ft. of gas @ 5s. per 1,000 cu.ft. ..	£3.967
Ratio of net cost of coal, as gas, to revenue/ton ..	40.4%
Therms sold per ton = 71.3 @ 13.33d. per therm ..	£3.967
Leakage allowed @..	6%
Ratio of gross cost of coal to revenue per ton, gas ..	65.6%

Steam required is presumed to be generated in W.H. boiler.

Thermal Balance

	Therms
One ton coal yield 16,880 cu.ft. × 450 C.V. gas ..	76.00
9.5 cwt. coke @ 12,500 B.Th.U./lb.	133.00
1.0 cwt. breeze @ 10,000 B.Th.U./lb.	11.20
16 gall. tar @ 16,000 C.V./lb.	27.40
1 gall. benzole sp. gr. 0.878	1.58
	249.18

Debit .. Coal 300 therms/ton. Credit .. 249.18 or 83.06%

	Yield %
Gas	25.333
Coke	44.333
Breeze	3.733
Tar	9.133
Benzole	.526
	83.058%

Thermal efficiency of gas production equals 60%.

Thermal efficiency of process plant equals 83%.

Lb. of steam used per ton coal = 493 lb.

TABLE IV.—*Single Stage Vertical Retort Plant with Steaming*, 15%

Coal C containing 18% ash and 4% moisture.

	£ s. d.
One ton of coal d/d @ 46s. per ton (18% ash)	2 6 0
Less residuals—	£ s. d.
Coke sold, 8 cwt. @ 40s. per ton	16 0
Breeze, 1.4 cwt. @ 15s. per ton	1 0.5
Tar, 12.5 gall. @ 4d. per gall.	4 2
Liquor, 30 gall. sold as sulphate, net costs deducted ..	7.5
Benzole, 1 gall. @ 1s. 6d. per gall.	1 6
	£1 3 4

Cost of coal £2 6 0, less residuals £1 3 4 = £1 2 8 net cost of coal.

Make per ton, 15,110 cu.ft. × 450 C.V. gas. 68 therms per ton.

	Cost per 1,000 cu.ft. d.	Cost per therm d.
Gas	18.00	4.00
Purification	0.60	.133
Salaries and wages	3.25	.7225
Wear and Tear	5.60	1.244
	27.45	6.0995

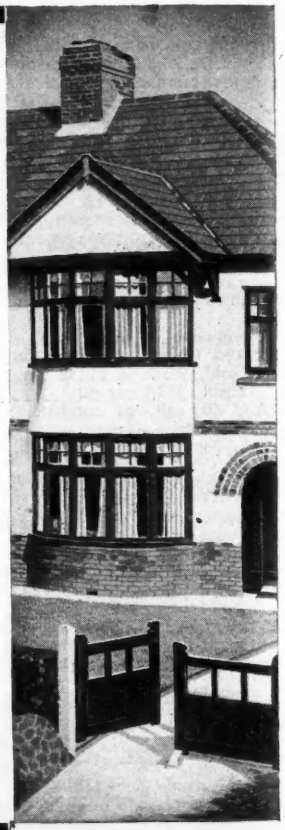
Total cost of gas into holders per ton coal carbonized 15,110 × 27.45	£1,728
By sale of 14,203 cu.ft. of gas @ 5s. per 1,000 cu.ft. ..	£3,550

HOT WATER—

ESSENTIAL

SERVICE

IN EVERY HOME



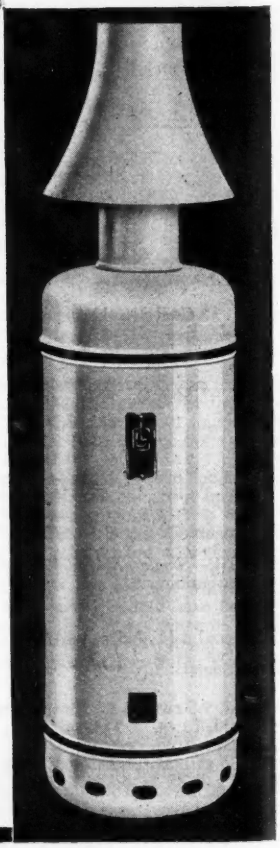
MAIN

G·L·C CIRCULATOR—

ESSENTIAL FOR

CONSTANT

HOT WATER.



MAIN WATER HEATERS LTD.
GOTHIC WORKS, THORNTON ROAD, CROYDON

Ratio of net cost of gas coal, as gas, to revenue/ton ..	48.75%
Leakage allowed @..	6%
Therm sold per ton = 64 therms @ 13.33d. per therm	£3.55
Ratio of gross cost of coal to revenue per ton	64.8%
Steam required is presumed to be generated in W.H. boiler.	

Thermal Balance

	Therms
One ton of coal yield 15,110 cu.ft. × 450 gas	68.00
Coke, 8 cwt. @ 12,000 B.Th.U./lb.	107.52
Breeze, 1.4 cwt. @ 9.500 B.Th.U/lb.	14.90
Tar, 12.5 gall (sp. gr. 1.08) @ 16,000 B.Th.U./lb. ..	21.60
Benzole, 1 gall. (sp. gr. 0878—)	1.58
	213.60

Debit .. Coal 280 therms. Credit .. 213.6 = 76.31%

	Heat recovered %
Gas	24.30
Coke	38.40
Breeze	5.325
Tar	7.720
Benzole	.565
	76.310
Fuel and loss ..	23.690
	100.000

Thermal efficiency of gas production equals 50.65%

Thermal efficiency of process 76.31%

Lb. steam used per ton coal = 336 lb.

Summary for Coals "A," "B" and "C"

	"A"	"B"	"C"
1. Content of moisture ..	4.0%	4.0%	4.0%
2. Content of ash	4.0%	8.0%	18.0%
3. Steaming	30.0%	22.0%	15.0%
4. Heat in coal, terms per ton	310.0	300.0	280.0
5. Ash in coke	6.0%	12.0%	27.0%
6. Make of gas per ton of coal, cu.ft.	18,220	16,880	15,110
7. Calorific value of gas ..	450	450	450
8. Coke for sale in cwt. per ton of coal	10.3	9.5	8
9. Breeze for sale in cwt. per ton of coal	0.9	1.0	1.4
10. Tar for sale in gall. per ton of coal	18	16.0	12.5
11. Saleable gas per ton of coal in cu.ft.	17,127	15,867	14,203
12. Revenue/ton @ 5s. 1,000 cu.ft.	£4 5 7	£3 19 4	£3 11 0
13. Revenue from residuals/ton coal	£1 19 10.3	£1 13 0.7	£1 3 4
14. Cost/gas into holder/1,000 cu.ft. (d) ..	19.93	22.79	27.45
15. Cost/therm into holder (d)	4.431	5.0593	6.0995
16. Sale price per therm of gas (d).. ..	13.33	13.33	13.33
17. Gas production thermal efficiency, %	66.35	60.00	50.65
18. Process thermal efficiency, %	86.57	83.06	76.31
19. B.Th.U. per lb. of coal carbonized	13,830	13,400	12,500
20. Percentage yield of gas..	26.46	25.33	24.30
21. Percentage yield of coke	46.46	44.31	38.40
22. Percentage yield of breeze	3.20	3.73	5.32
23. Percentage yield of tar..	9.94	9.13	7.72
24. Percentage yield of benzole	.51	.50	.56
25. Percentage yield of fuel and loss	13.43	17.00	23.69
26. Lb. of steam/ton coal, lb.	672	493	336
27. Coke used as fuel in producers	10%	15%	16.4%
28. Coke used as fuel in producers, cwt./ton ..	2	3	3.28
29. Weight of ash in lb./ton of coal..	89.6	179.2	403.2
30. Weight of ash in lb. coke and breeze	134	269	605
31. Percentage increase in ash coal to coke ..	50	50	50

With reference to the increased percentage of ash and reduction of volatile matter in relation to size of coal, the following data of tests made by the writer will show the importance of size and its influence on S.Y. coal.

TABLE V

Name of coal, Newton Chambers "Tankersley."
Average size ⅜ in.

Through screen square mesh ..	½ in.	⅛ in.	⅛ in.	¼ in.	⅜ in.	½ in.	Over ½ in.
Per cent. through ..	3.12	6.9	13.2	43.2	14.62	15	1.35
Volatile matter, % ..	12.71	20.96	18.16	18.68	23.94	23.9	
Ash content, % ..	22.86	21.30	23.02	28.98	10.6	14.42	

Name of coal, Old Silkstone "Stanhope."
Average size ½ in. slack.

Per cent. through ..	3.79	11.87	14.7	50.31	11.7	3.62
Volatile matter, % ..	21.96	25.2	22.2	27.28	24.32	26.4
Ash content, % ..	19.16	11.98	14.16	17.94	18.14	16.24

Name of coal, Dinnington Main Slack.
Average size ½ in. slack.

Per cent. through ..	11.25	35.6	30.6	15.6
Volatile matter, % ..	19.86	24.4	14.52	19.26
Ash content, % ..	23.62	23.5	25.64	22.08

Name of coal, Old Silkstone Parkgate.
Average size ½ in. slack.

Per cent. through ..	4.7	6.51	9.37	40.62	19.37	16.9
Volatile matter, % ..	8.64	24.72	18.48	20.18	22.40	26.02
Ash content, % ..	18.22	13.50	13.62	4.44	5.04	8.98

Name of coal, Hy. Briggs & Co. Whitwood.
Average size ¾ in. slack.

Per cent. through ..	2.81	6.56	9.68	48.12	13.12	18.12
Volatile matter, % ..	14.08	16.82	22.66	24.38	31.02	29.80
Ash content, % ..	24.06	26.13	27.30	24.34	16.28	7.98

The results in this table V seem to indicate in a fairly clear manner that the finer coal oxidises more quickly than the larger particles, and loses its volatile hydrocarbons in so doing. The ash content is also higher but not exactly in proportion to the degree of fineness since the shale or ash forming substances do not appear to break down so readily as the true coal, being harder and of greater density.

There can be no question that fine coal will not withstand storage even for a comparatively short time, without suffering serious deterioration.

Coke Testing for Domestic Purposes

The testing of coke (H.T.) in various types of domestic open grates has doubtless given a great deal of useful information, and should be continued indefinitely. The artificial activation of high temperature coke by the addition of chemicals is not likely to be a success, in spite of improvements claimed. The domestic coke user would not be bothered with it, if he had to spray the coke prior to its use. If spraying be carried out at the gas-works, it is rather an expensive matter and few people would believe it was worth the extra cost. It would also open the door to fraud by unscrupulous dealers selling untreated coke as chemically treated. This kind of thing has already been exposed in the daily Press.

A method of testing cokes in ordinary domestic open fire grates was suggested by the writer many years ago, but up to the present it does not appear to have been applied, perhaps owing to cost.

The idea is to have constructed in some place far removed from external noises a perfectly sound proof room, within which a domestic grate is fitted in such a way that it is sound insulated when in position.

The air supply should be admitted to the test room through numerous apertures, near the ceiling so as to avoid the creation of sound by air velocity. The fire would be started with coke undergoing test and when well ignited, a "super sensitive" microphone and multiamplifier in a special portable frame, is placed in front of the fire as near as possible without endangering the apparatus. The sound recorder, or listening post, would be placed outside the building, since the mere act of a man breathing would register and spoil the test.

With an amplification of about 1,000 times, the "tread of a fly sounds like that of an elephant in a rage." As is well known, high ash coke "talks very loudly" during combustion and its "note" varies with the content of ash in the coke. This can be determined without a microphone, if one has two fires, one with coke of 25% ash, and one with

coalite with only 5% of ash. The latter gives almost silent combustion, whereas the former gives a peculiar and very annoying cracking sound due to decrepitation of the silicatious ash when heated to a temperature of upwards of 1,000°C.

Further, the cell structure of high temperature coke differs from that of low temperature fuel and the sound test may help in determining the best process to adopt to overcome the present ignition and combustion difficulties pertaining to high temperature coke for the old-fashioned domestic open grate.

A good deal of the trouble is due to over-aeration, and low velocity, coupled with initial size of the coke. The column-height volume and insulation also prevent success with H.T. coke.

In conclusion, one can appreciate the difficulties that have to be faced to hold a two-fuel domestic market for the Gas Industry.

Load Development and Distribution in the Ascot Area*

By J. W. KAYE,

Engineer and Manager, Gas Department, Ascot Gas and Electricity Company

(*Continued from p. 625*)

SAFEGUARDS for the automatic starting and stopping of the machinery were, (1) a cut-out switch which was operated by a pressure gauge with adjustable contacts which were set to stop the machinery when the pressure in the cylinders attained 100 lb. per sq. in.; (2) a low pressure diaphragm which operated an electrical switch to stop the compressors if the pressure on the inlet side fell below a predetermined pressure, this being set, for our purpose, at 3 in. W.G.

The compressors are water-cooled and inserted in the outlet from the water jackets is an electrically-operated thermostat which also stops the machine if the water rises beyond a maximum temperature, usually 140°F. The compressors are fitted with a motorized unloading device which operates when starting up until full speed is attained. Thus the whole of this equipment is fully automatic.

From the outlet of the storage cylinders is a connexion back into the low pressure distribution feeder working through a high pressure reducing governor, which is set to operate at a predetermined outlet pressure. For our purpose this pressure is set at 5 in. W.G.

This plant has been at work for some two years and requires no attention other than a daily call to change the pressure charts and to remove the chart from the gas flow recorder, and a weekly visit by a mechanic who inspects the machines, carries out any adjustments, sees that all lubricators are refilled, and changes from one set to another on alternate weeks.

The effect of this plant has been to level up those dips shown by the pressure chart during the peak periods when pressures previously had fallen below 2 in. W.G.

Sales Organization

A sales organization was built up in readiness to play its full part in the development plan, and the district was divided into areas to which Sales Representatives were appointed, each representative being apportioned an area containing roughly 3,000 houses of all types.

The method of approach for these Sales Representatives was largely carried out by the invitation of the consumer. For instance, a disputed account or a complaint about an appliance—all were passed on to the district representative for that area, together with full information as to the consumer's requirements, and a sales representative followed up by calling after attention had been given by the appropriate department. Each representative, as a matter of routine, made a personal call upon every newcomer to the district, and was also supplied with addresses where no gas was installed. In this way he completely covered his part of the area and was very soon known by many of the residents on his ground and regarded as THE MAN with whom to talk over gas matters. Although Sales Representatives were not responsible for the supervision of gas fitters, the work of the latter was divided into the same areas as those covered by the representatives who were kept in touch by meeting the district foremen every morning and being informed of the work going on in their area. Meetings were arranged, approximately every fortnight, and all the sales staff, including indoor salesmen, were given information regarding publicity matter in hand, forthcoming newspaper advertisements, and any circularizing which was being done by enclosures with accounts. At these meetings informal discussions took place, and representatives were encouraged to talk over and describe the reactions of the consumers to the publicity or special sales campaigns which were for the time being in hand. All this information was sifted and filed to be used as a guide for future sales policy.

Authorized Dealers

A scheme for appointed authorized dealers was available, and all builders, builders' merchants, and ironmongers throughout the area were invited to join. The success of this scheme may be judged by the fact that 81% of the total builders and allied trades in the area became authorized dealers.

Perhaps the greatest advantage to the Company resulting from this scheme was that builders who felt incompetent of making sales outright to their clients brought them along to our showrooms. Thus very few new appliances from an outside source were brought into the area without the Company's knowledge, and the Company were in a better position to ensure that none but accredited appliances were fitted.

Perhaps of more value even than this latter point was the extraordinarily friendly relationship which developed between the Company's representatives and all these builders and merchants throughout the district, and the contrast was so marked, compared with the half-suspicious atmosphere which existed prior to the scheme being launched.

Special sales campaigns and exhibitions, usually of one week's duration, were held in the village halls throughout the area. These, too, were attended by the sales representative in whose area the exhibition was being held, the object being to ensure as far as possible that all visitors to the exhibition from the surrounding area should recognize at least one member of the Company's staff whom they knew and in whom they had confidence in discussing the exhibits.

At these exhibitions opportunity was also taken of cementing the relationship with the authorized dealers by inviting them from all over the area to a private view during the week.

Sales schemes were promoted among gas fitters, meter readers and slot collectors. Each had an equal opportunity of introducing new business to the consumers and were rewarded by commission and bonus at the year end.

It is interesting to compare the value of appliances and the average sale per consumer on the Company's books during the years 1932 and 1939, namely:—

	Total sold	Average sales per consumer
	£	s.
1932	3,310	18.8
1939	18,575	58.3

Throughout the organization every member of the staff has been encouraged to talk over gas matters with consumers and never to put a consumer off by "passing the buck," but to bring back the enquiry where it will have attention in cases where the answer cannot be given outright. In this way it is hoped that the consumers picture the undertaking always trying to be helpful, and dealing with their enquiries as efficiently and expeditiously as possible.

* Paper presented to the Southern Association of Gas Engineers and Managers (Eastern District), Feb. 25

The special tariff for central heating and hot water, when comparing the percentage sold over the four quarters of the year, gives a maximum load of 31.8%, against a minimum of 19.4%. This appears to be a very satisfactory result, and is explained by the fact that the total therms sold include also the domestic hot water load. It is known that, for hot water, a substantial number of therms are sold in the two summer quarters for auxiliary water heating while solid fuel heating is used in the winter. This bears out the contention that hot water, whether used in circulation for heating radiators or for domestic purposes, should be regarded as one class of business. Taking the two-part tariff for all domestic purposes for a maximum quarter this represents 32.4% of the load, while the minimum is 17.2%—which does not give such an even loading as that for central heating and hot water. Upon consideration it would appear that the reason for this is because a considerable amount of occasional space heating during very cold weather is included in this tariff. The load factor for general domestic and automatic consumers is quite good and is a most conveniently balanced load throughout the year. I do think, however, that this is likely to be considerably affected now that "holidays with pay" have become the usual practice for the working people, and it must be accepted that both ordinary and prepayment consumptions will fall off as more and more people begin to take holidays during the summer months. The loads for baking, fish frying, and special contracts need no comment, as these represent a very small proportion of the business.

I mentioned earlier that the commodity charge for central heating and hot water was 4½d. per therm, while that for the domestic two-part tariff for ordinary consumers was 5d. per therm.

At the time that these commodity charges were fixed the cost of gas manufactured, *i.e.*, all materials, maintenance of works, and wages, up to the gasholder, including depreciation, less receipts from residuals, was 3.36d., or for those who prefer it, the cost of gas sold was 3.8d. per therm.

The standing charges, both in the case of the domestic two-part tariff and the water heating, were comparatively high because, in addition to servicing, they included a proportion of distribution, sales, general administration, and collection costs. The critical consumptions when compared with ordinary selling prices were approximately 100 therms per annum for very small houses, ranging up to 350 therms per annum for large houses.

Structure of Tariffs

A good deal has been said and published recently on the structure of tariffs, and considerable opinion favours the block rate method of charge, but where two-part tariffs are used the commodity charge is built up on production costs, distribution sales, and general administration and collection costs, with production cost also bearing its proportion of interest on capital expenditure.

If this is to be related to load factors, which, of course, vary considerably with the different types of load, it presupposes that the commodity cost will also vary

I must admit that I prefer the former method of the low commodity price with the standing charge bearing the proportion of costs other than production costs. An advantage, to my mind, is the fact that the standing charge is better suited to bear these costs, as it remains constant over the whole year. Secondly, while this method may not be in complete harmony with modern accountancy methods, it would appear that the first step over and above all other considerations in producing a tariff is that it must be so constructed as to be attractive to existing and prospective consumers. This applied with very much greater force in the days before the war, when competition, not only from electricity, but from coal and oil, was keen, and although these are the days of sellers' markets, certainly within the next five years, keen competition will again be felt from those same sources in all the markets in which gas is utilized.

Finally, it may be of some interest to know that the development of these loads stood the Company in good stead in the early years of the war, when, until 1944, without any adjustment of price due to increased costs of labour and materials, the revenue account produced sufficient surplus to meet depreciation, interest, and all other charges, and still left a little surplus. The simple explanation is that the load development had absorbed administrative and other charges, which, lumped together, may be called "overhead charges," to such an extent as to compensate almost entirely for the increased costs of materials and wages.

Looking back on this period of development, one is tempted to try to analyze the reasons for the expansion. Certain it is that, generally, the standard of life has risen. The available expenditure of families has been a rising curve culminating in a peak during the last years of the war, and although slightly less at the present time, the available money for expenditure is still very much in excess of that before the war.

Greater Comfort in the Home

It is not reasonable, therefore, to suppose that the people's thoughts would turn to greater comfort in the home. How much have our efforts influenced and directed their thoughts to the greater use of gas, which I still firmly believe to be the most convenient of all forms of fuel for heat utilization; and, even though the money available for expenditure may fall somewhat, will they be willing to economize in the use of gas after experiencing the convenience and service which it can provide?

It is certain that the effect of rationing solid fuel has brought about a greater use of gas, and because of the better service provided I think the people will prefer to retain its use rather than revert to the use of raw coal if and when it becomes available.

I am convinced that, providing we sell our commodity on attractive terms, and continue to give the good service and to encourage that friendly relationship which has developed during the war years between the consumers and our staff and workpeople, we shall at least take our full share in the business of heat utilization.

Since the war a revolutionary change has come about in the running of the homes in this country. In the first place, the wide difference in the ranges of incomes has been greatly narrowed, and no longer are there many people to be found who can afford to maintain large houses and mansions. Even had they the means to do so, there is not the domestic staff available, and the wealthiest of people will prefer a smaller house with all the modern refinements for easy running, while the existing large houses are likely to be converted into clubs and luxury flats. The present day design of houses, even Council houses, trends more and more towards the greater use of appliances which will reduce domestic labour. In new houses, also, greater care and attention are being paid to insulating value. All this will tend to permit of the use of fuel "on tap" in a more luxurious manner.

Automatic Plant

The day will surely come when automatic gas-operated plant for air heating and conditioning will be used, especially in the modern luxury homes. One of the difficulties to be overcome in accommodating this type of heating is the traditional design of building. In America this has been largely overcome by reason of the fact that most houses are built with basements in which the equipment is conveniently housed, while the trunking which requires quite a large surface area is carried straight up the walls through the floors, thus dispensing with the need for carrying trunking across floors and under ceilings. I can see no reason why similar equipment should not be used in this country and placed in the roof, where at this level the intake of air is at its freshest, and trunking can be carried down the walls. Very modern plants are available and in popular use in America equipped with air filters and humidifiers. The additional advantage of this type of plant is that not only does one get the best possible form of heating in the winter time, but the plant can also be used in the summer time for keeping the house deliciously cool. This type of plant should have a much better load factor than central heating because of the ease with which air heating would be shut off in rooms which were not for the time being occupied. For instance, occupational rooms would be heated during the day, with the bedrooms closed off, while the bedrooms would be heated at a reduced temperature during the night; and even if the plant did not operate at all during the summer months, this would provide a suitable opportunity for the much harassed gas manager to overhaul his plant in readiness for the following seasonal load.